CENTRAL VALLEY REGIONAL
WATER QUALITY CONTROL BOARD

Amendments to The Water Quality Control Plan for the Sacramento River and San Joaquin River Basins For The Control of Methylmercury in The Sacramento-San Joaquin Delta Estuary

Staff Report

Draft Report for
Scientific Peer Review

June 2006

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

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AMENDMENTS TO THE WATER QUALITY CONTROL PLAN FOR THE SACRAMENTO RIVER AND SAN JOAQUIN RIVER BASINS FOR THE CONTROL OF METHYLMERCURY AND TOTAL MERCURY IN THE SACRAMENTO-SAN JOAQUIN DELTA ESTUARY

Draft Report for Scientific Peer Review

EXECUTIVE SUMMARY

This Central Valley Regional Water Quality Control Board (Central Valley Water Board) staff report describes a proposal to amend the Water Quality Control Plan (Basin Plan) for the Sacramento River and San Joaquin River Basins to address the regulation of methylmercury and total mercury in the Sacramento-San Joaquin Delta Estuary (the Delta). Central Valley Water Board staff will circulate this staff report and the enclosed draft Basin Plan amendments for public review and comment prior to Central Valley Water Board consideration. The section following the Table of Contents provides the recommended format for comment submittal.

Major components of the proposed amendments are:

- Addition of a beneficial use designation of commercial and/or sport fishing (COMM) for the Delta;
- Numeric objectives for methylmercury in fish tissue that are specific to the Delta;
- An implementation plan for controlling methylmercury and total mercury sources; and
- A surveillance and monitoring program.

The Delta is on the Clean Water Act Section 303(d) List of Impaired Water Bodies because of elevated levels of mercury in fish. The goal of the proposed Basin Plan amendments (next section) is to lower fish mercury levels in the Delta so that the beneficial uses of fishing and wildlife habitat are attained.

Proposed Modifications to Basin Plan Chapter II (Existing and Potential Beneficial Uses)

Staff proposes the addition of the commercial and sport fishing (COMM) beneficial use for the Delta. Sport and commercial fishing is an existing beneficial use in the Delta.

Proposed Modifications to Basin Plan Chapter III (Water Quality Objectives)

Staff proposes numeric objectives for methylmercury in fish tissue for the Delta. Methylmercury is the most toxic form of mercury and accumulates in successive levels of the food chain. It is a neurotoxicant that adversely affects reproductive and immune systems in humans and wildlife that consume fish. Nearly all methylmercury is acquired through consumption of mercury contaminated fish and shellfish.

Staff considered five alternatives for the methylmercury numeric objectives, including no action and a range of fish tissue objectives that are based on varying fish consumption rates and fish trophic levels. The recommended alternative would establish Delta-specific methylmercury objectives of 0.24 and 0.08 mg/kg, wet weight, in fish tissue for large trophic level 4 and 3 fish (legal size if designated by the California Department of Fish and Game, otherwise 150-500 mm total length) and 0.03 mg/kg, wet

weight, for small trophic level 2 and 3 fish (less than 50 mm). This alternative allows people to safely eat 32 g/day (one meal per week) of trophic level 3 and 4 fish from the Delta along with a moderate amount of commercial fish. The 32 g/day consumption rate is consistent with the consumption rate that staff of the San Francisco Bay Regional Water Quality Control Board (San Francisco Bay Water Board) is recommending for a methylmercury objective for San Francisco Bay. The proposed objectives are protective of threatened and endangered species that consume large and small Delta fish.

Proposed Modifications to Basin Plan Chapter IV (Implementation)

To achieve the proposed water quality objectives, staff proposes the addition of an implementation plan with actions and time schedules to reduce methyl and total mercury sources to the Delta. The strategy includes methylmercury allocations based on an aqueous methylmercury implementation goal that is linked to the proposed fish tissue objectives. Available information indicates that achieving an annual average methylmercury (unfiltered) concentration of 0.06 ng/l in Delta waters would enable attainment of the proposed Delta fish tissue objectives. In addition, the strategy includes total mercury limits designed to achieve the five-year average annual total mercury load decrease of 110 kg/yr required by the San Francisco Bay mercury control program developed by the San Francisco Bay Water Board.

Sources of methylmercury in Delta waters include tributary inputs from upstream watersheds and within-Delta sources such as sediment flux from wetlands and open water habitats, municipal and industrial wastewater, agricultural drainage, urban runoff and atmospheric deposition. Available information indicates that about 60% of methylmercury loading to the Delta comes from tributary inputs and about 40% comes from within-Delta sources. Sediment flux from wetland and open water habitats in the Delta may account for most of the within-Delta annual loading with contributions of about 31% of annual loading, and wastewater treatment plants and agricultural runoff may account for about 4% and 3%, respectively. Separate methylmercury allocation systems are required for the different hydrologic areas of the Delta because fish mercury impairment and the type and amount of the methylmercury inputs to each area are substantially different. For example, wetland habitat within the Yolo Bypass subarea may contribute almost as much methylmercury to the subarea as its tributaries, compared to the Sacramento and San Joaquin subareas, which receive substantially more annual methylmercury loading from their tributaries.

In contrast to the proportion of within-Delta/tributary methylmercury inputs, more than 96% of total mercury loading to the Delta comes from tributary inputs. Sources of total mercury identified in the Delta include atmospheric deposition, urban runoff, dredging activities, and municipal and industrial wastewater. Sources of total mercury in the Delta's tributary watersheds include gold and mercury mine sites, legacy mercury in the stream channel sediments, geothermal springs, atmospheric deposition, urban runoff, and municipal and industrial wastewater.

An almost infinite number of implementation alternatives are possible for reducing the variety of methyl and total mercury sources. For this draft report, Staff identified eleven considerations that could substantially guide the implementation program, evaluated a variety of options for each consideration, formulated four alternatives based on those options, and analyzed the alternatives against evaluation criteria to select a preferred alternative. Staff recommends the adoption of an implementation plan based on the preferred alternative, which considers technical and economic feasibility and jurisdictional constraints. The preferred alternative has the following components:

- Incorporate **methylmercury allocations** for methylmercury point and nonpoint sources in the Delta and within 30 miles upstream of the Delta. Methylmercury allocations are used as guidance for methylmercury characterization and control studies.
- Incorporate a mercury characterization and control study period as **Phase 1** (2007-2014) of the implementation program.
- Characterize and limit existing methylmercury inputs that result from flood conveyance, maintenance of salinity standards and other water management practices; require mitigation for impacts caused by future changes to flood conveyance and other water management practices; and recommend actions for the agencies responsible for water management.
- New methylmercury sources that begin discharge between the amendment adoption date and 2014 would be considered in compliance with the Delta mercury control program if their responsible parties participate in the source characterization and control studies and submit a methylmercury control plan to the Central Valley Water Board at the completion of the studies. Depending on the magnitude of new sources that begin discharging before 2014, methylmercury allocations may need to be adjusted to accommodate any resulting increase in ambient methylmercury concentrations.
- By 2014, staff reviews study results, methylmercury control options, and methylmercury allocations, revises the TMDL, and recommends changes to the methylmercury control program. The Central Valley Water Board considers a Basin Plan amendment for an updated methylmercury control program.
- For **Phase 2** of the methylmercury control program (after 2014), responsible parties implement approved methylmercury control actions based on the results from the Phase 1 study period and ongoing CalFed studies. Full compliance with the methylmercury allocations is required by 2029, or sooner if required by Regional Board adopted implementation schedules.
- Include a conditional prohibition of methylmercury discharge after 2014.
- Require that methylmercury concentrations in the Delta's ambient waters not increase as a result of new or expanded projects initiated after 2014. Return waters from new agricultural areas or wetland or other habitat restoration projects would require mitigation for that portion of their loading that increases their methylmercury concentration above their source water methylmercury concentration. Other new sources discharging methylmercury concentrations less than the implementation goal (0.06 ng/l methylmercury) would be allowed to contribute methylmercury loading to the Delta. However, new sources with discharge methylmercury concentrations greater than the implementation goal would need to mitigate that portion of their load that increases their discharge concentrations above the implementation goal.
- Incorporate **total mercury limits** for point sources in the Delta and its tributary watersheds downstream of major dams, and reduction actions for tributary watersheds that export the most mercury-contaminated sediment to the Delta to reduce overall total mercury loading to the Delta by 110 kg/yr.
- Require that total mercury loading to the Delta not increase as a result of new or expanded projects. Any increase in total mercury loading would need to be mitigated or in compliance with an offset program. In the absence of an approved offset program, the Central Valley Water Board Executive Officer would evaluate new projects on an individual basis when establishing total mercury load limits in permits.

- Develop an **offset program** for total mercury based on currently available information for Central Valley Water Board consideration in 2009. Develop a methylmercury offset program in 2014, so that the program can be guided by results available from the proposed methylmercury characterization and control studies.
- Incorporate an **expanded public education and outreach program** that coordinates efforts between public agencies, dischargers and other stakeholders.

The above bulleted text describes the strategy for achieving the proposed water quality objectives. Staff divided the implementation program into two phases. The proposed Basin Plan amendments identify the actions to be taken during Phase I of the implementation program. Phase I actions and responsible parties are highlighted below.

Characterization and Control Studies. Parties responsible for maintaining or reducing methylmercury inputs to the Delta or within 30 miles upstream of the Delta are required to evaluate methyl and total mercury concentrations and loads in source and receiving waters and discharges, identify variables that control methylmercury production, and propose management practices and implementation schedules to reduce methylmercury loads and concentrations by December 2012. Parties responsible for characterization and control studies include:

- NPDES-permitted wastewater treatment plants (WWTPs) that discharge greater than one million gallons per day (mgd) and Phase I municipal separate storm sewer systems;
- Entities responsible for Cache Creek Settling Basin operations and maintenance, salinity control in the Delta, Yolo Bypass flood conveyance, and other water management activities (e.g., the South Delta Improvement Project or new or expanded reservoirs); and
- Agricultural and wetland landowners and management agencies.

Responsible parties within each source category may develop either individual or collaborative studies. The State Water Board is requested to fund or conduct studies to develop and evaluate management practices to reduce methylmercury discharges from nonpoint sources.

Conditional Prohibition of Methylmercury Discharge after 2014. The discharge of methylmercury into the Delta or its tributaries within 30 miles of the legal Delta boundary would be conditionally prohibited after 31 December 2014, unless (1) the fish tissue mercury objectives for the Delta are being met, (2) methylmercury allocations have been met, (3) the methylmercury discharge concentration is less than 0.06 ng/l (or, for agricultural and wetland discharges, less than source water methylmercury concentration), or (4) responsible parties have conducted characterization and control studies by December 2012 and implemented control actions in accordance with Central Valley Water Board adopted plans and schedules.

Total Mercury Control Actions. Responsible parties within three source categories may be required to begin implementing total mercury source control actions during Phase I of the implementation program:

- Total mercury limits based on 2008 loads are proposed for NPDES-permitted WWTPs that discharge greater than 1 mgd within the Delta and in tributaries to the Delta downstream from major dams. In addition, these facilities (a) must implement a Pollution Prevention Plan for total mercury in compliance with Section 13263.3 of the California Water Code and maintain compliance with a USEPA approved pretreatment program, as applicable, and (b) must not exceed their 2006 annual average mercury concentration. After 2008, the WWTPs would need to

implement control actions or participate in an approved offset program to maintain the 2008 load limits.

- Clean Water Act 401 Water Quality Certifications for dredging projects in the Delta will include conditions to ensure that there will be no net increase in methyl and total mercury loads from dredging activities in Delta waterways, including sediment monitoring, management practices to minimize sediment releases, and protection of dredged material with elevated total mercury concentrations from erosion by 100-year precipitation or flow conditions.

- Agencies responsible for Cache Creek Settling Basin operations and maintenance should propose a plan by December 2007 to reduce total mercury discharges by 42 kg/yr and to begin implementation by December 2010.

Total mercury load reductions from the WWTPs and Cache Creek Settling Basin may be accomplished through a mercury offset program.

Offset Program for Total Mercury. An offset program would allow dischargers to offset methyl or total mercury loads in excess of requirements by implementing more feasible or cost effective projects elsewhere in the watershed. Staff will work with the State Water Board, USEPA and stakeholders to develop the framework of an offset program for Central Valley Water Board consideration as a potential Basin Plan amendment in 2009. Amendments for methylmercury offsets would be considered after the characterization and control studies are completed.

Strategy for Expansion of Existing Public Education Programs. The Central Valley Water Board and its staff will work with the State Water Board, OEHHA, CDHS, local county health departments, and dischargers to develop a strategy for expanding and sustaining existing public education and outreach programs and will support stakeholders implementing the strategy.

Additional methyl and total mercury control actions will be identified by Phase II of the proposed implementation program and implemented in future Basin Plan amendments. By December 2014, the Central Valley Water Board will evaluate the completed characterization and control studies, proposed methyl and total mercury control actions and implementation schedules, and the environmental impacts of the proposed control actions.

Proposed Modifications to Basin Plan Chapter V (Surveillance and Monitoring)

Staff proposes a surveillance and monitoring program to ensure compliance with the fish tissue methylmercury objectives and methyl and total mercury reduction strategy proposed for addition to Chapters III and IV. The program includes fish tissue, water, and sediment monitoring.

DRAFT BASIN PLAN AMENDMENT

Text additions to the existing Basin Plan language are underlined and text deletions are indicated by ~~strikethrough~~. (NOTE: For this review edition, underline is not used for ease of reading- everything below is new language) Revise Basin Plan sections as follows:

Revise Chapter II (Existing and Potential Beneficial Uses), Table II-1 to add a footnote for Sacramento San Joaquin Delta:

Sacramento San Joaquin Delta (8,9, a)

Footnote (a) Sacramento San Joaquin Delta: COMM

Revise Chapter III (Water Quality Objectives), Methylmercury, to add as follows:

For the Sacramento San Joaquin Delta, the average methylmercury concentrations shall not exceed 0.08 and 0.24 mg methylmercury/ kg, wet weight, in muscle tissue of large trophic level 3 and 4 fish, respectively (150-500 mm total length unless legal catch size designated by the California Department of Fish and Game). These objectives are protective of (a) humans eating 32 g/day (1 meal/week) of commonly consumed, large fish; and (b) all wildlife species that consume large fish. The average methylmercury concentrations shall not exceed 0.03 mg methylmercury/ kg, wet weight, in whole trophic level 2 and 3 fish less than 50 mm in length. This objective is protective of wildlife species that consume small fish.

Revise Chapter IV (Implementation), under "Mercury Discharges in the Sacramento River and San Joaquin River Basins" to add:

Delta Methylmercury Program:

The goal of the control program is to achieve the methylmercury fish tissue objectives throughout the Delta. Fish tissue methylmercury concentrations are directly linked to the concentration of methylmercury in the water. Available information indicates that meeting an annual average aqueous methylmercury (unfiltered) goal of 0.06 ng/l will achieve the Delta fish tissue objectives. The aqueous methylmercury goal applies to the average annual ambient water methylmercury concentration. In some areas of the Delta significant reductions in methylmercury inputs are necessary to achieve the aqueous methylmercury goal. Methylmercury allocations and implementation of actions to address the sources set forth in this control program will result in achieving the aqueous methylmercury goal. Allocations are specific to Delta subareas, which are shown on Figure IV-1.

The concentration of total mercury in sediment is one of the main factors for methylmercury production. Point and nonpoint sources contribute total mercury to the Delta. The control program includes requirements for addressing sediment and for controlling total mercury loads from point and nonpoint sources. The control program includes requirements to reduce total mercury loading to San Francisco Bay, as required by the San Francisco Bay Water Board's total mercury allocations for the Central Valley.

Prohibition

The discharge of methylmercury into the Delta or its tributaries within the legal Delta and for 30 miles beyond the legal boundary (Figure IV-1) is conditionally prohibited after 31 December 2014, unless 1) the fish tissue mercury objectives for the Delta are being met, 2) methylmercury allocations have been met, 3) the methylmercury discharge concentration is less than 0.06 ng/l, or 4) responsible parties have conducted methylmercury **Characterization and Control Studies** by December 2012 and implemented control actions in accordance with Regional Board adopted plans and schedules.

Characterization and Control Studies

The control program requires **Characterization and Control Studies** to evaluate methylmercury and total mercury concentrations and loads in source and receiving waters and discharges, identify variables that control methylmercury production, and propose management practices and implementation schedules to reduce methylmercury loads and concentrations. Responsible parties within each source category can develop collaborative studies and will be considered to be in compliance with the study requirements if they participate in the collaborative studies and propose management practices and implementation schedules.

Responsible parties for **Characterization and Control Studies** shall submit study plans by December 2007 to the Regional Board for approval by the Executive Officer. By December 2009, responsible parties shall submit a report documenting progress towards complying with the study requirements and management practice development. By December 2012, the responsible parties shall complete the studies and submit results and proposed management practices to the Regional Board. In January 2008 and January 2010 staff will report to the Regional Board the responsible parties' progress towards compliance with the studies and management practice development.

By December 2014, the Regional Board will evaluate the completed studies, proposed management practices, implementation schedules, and the environmental impacts of proposed methylmercury control actions. The Regional Board may consider allowing any combination of the following: modification of methylmercury allocations or total mercury limits; adoption of management practices and implementation schedules for on-site methylmercury controls; or adoption of an offset program to compensate for loads in excess of the methylmercury allocations.

The State Water Board is requested to fund or conduct studies to develop and evaluate management practices to reduce methylmercury discharges from nonpoint sources.

The Central Valley and San Francisco Water Boards will conduct coordinated studies to evaluate methyl and total mercury loads that flux between the jurisdictional areas for future allocation revisions.

Methylmercury allocations are provided in Tables A, B, D, F, and G. Methylmercury allocations are required to be met by 2014 unless dischargers or discharger groups complete the studies and submit to the Regional Board the management plan discussed below by December 2012. Full compliance with the methylmercury allocations is required by 31 December 2029, or sooner if required by Regional Board adopted implementation schedules.

Agricultural Lands and Wetlands

This control program applies to agricultural lands and wetlands in the Delta and within 30 miles (Figure IV-1) of the Delta. Methylmercury allocations are included in Table A for each Delta

subarea. The allocations for each subarea apply to the sum of existing discharges. Responsible parties are encouraged to work together in each subarea to:

1. Complete **Characterization and Control Studies** to characterize methyl and total mercury concentrations and loads in source and receiving waters and discharges, and to identify variables that control methylmercury production; and
2. Develop management practices that can be implemented to achieve the methylmercury allocations, a time schedule for implementation and, if applicable, detailed information documenting why fully achieving the methylmercury allocations is infeasible.

Dischargers responsible for new sources of methylmercury from agricultural lands and wetlands that are proposed to be initiated between the effective date of this amendment and 2014 are prohibited unless discharge methylmercury concentrations are less than the source water methylmercury concentrations or the discharger conducts studies as discussed above and increases in methylmercury are approved by the Executive Officer. New discharges that begin after the effective date of this amendment may necessitate adjustments to the allocation assignments in 2014.

Discharges from agricultural lands and wetlands that exceed source water methylmercury concentrations are prohibited after 31 December 2014 in subareas where load allocations are not being met unless responsible parties (individuals or groups) complete the studies and submit to the Regional Board the management practices discussed above and increases in methylmercury are approved by the Executive Officer.

NPDES Wastewater Treatment Facilities

Methylmercury allocations apply to NPDES permitted facilities in the Delta or within 30 miles of the Delta (Table B, Figure IV-1). Methylmercury allocations are required to be met by 2014 unless dischargers or discharger groups complete the studies and submit to the Regional Board the management plan discussed below by December 2012. Facilities that discharge greater than 1 mgd are required to:

1. Complete **Characterization and Control Studies** to characterize methyl and total mercury concentrations and loads in influent, effluent and receiving waters, and to identify variables that control methylmercury production; and
2. Develop plans to achieve the methylmercury allocations, a time schedule for implementation and, if applicable, detailed information documenting why fully achieving the allocations is infeasible.

Smaller facilities are encouraged to coordinate and cooperate in the above studies.

Dischargers of new sources of methylmercury that are proposed to be initiated between the effective date of this amendment and 2014 are prohibited unless the discharge is less than 0.06 ng/l methylmercury, or the discharger conducts studies as discussed above and increases above 0.06 ng/l methylmercury are approved by the Executive Officer. New discharges that begin after the effective date of this amendment may necessitate adjustments to the allocations.

Total mercury load limits apply to NPDES permitted facilities that discharge greater than 1 mgd within the Delta and in tributaries to the Delta downstream from major dams (Table C).[1] The total mercury limit for a facility shall be the facility's 2008 annual mercury load. Facilities shall report their 2008 loads by 31 March 2009. Annual loads are calculated by the summation of monthly concentrations times monthly flows.[2]

From the effective date of this amendment until the date the Central Valley Water Board adopts a final Mercury Offset Program, a facility is in compliance with the total mercury limits if it (1) implements a Pollution Prevention Plan for total mercury in compliance with Section 13263.3 of the California Water Code and maintains compliance with a USEPA approved pretreatment program, as applicable, and (2) does not exceed the 2006 annual average mercury concentration.[3]

Dischargers whose mercury loads exceed the 2008 load limit shall maintain a Pollution Prevention Plan and either reduce their loads to surface waters to achieve the limit or offset the excess mercury in conformance with the final Mercury Offset Program. A Mercury Offset Program is anticipated for Regional Board consideration in 2009. In the absence of a final Mercury Offset Program, the 2008 load limits will continue to be in effect. After 2008, the Executive Officer will evaluate new NPDES facilities on an individual basis when establishing total mercury load limits in permits.

Facilities that discharge less than 1 mgd are required to implement a Pollution Prevention Plan for total mercury in compliance with Section 13263.3 of the California Water Code and maintain compliance with a USEPA approved pretreatment program, as applicable.

Urban Runoff

Methylmercury allocations for urban runoff shall be implemented through NPDES Municipal Separate Storm Sewer Systems (MS4) permits issued to urban runoff management agencies in the Delta and within 30 miles of the Delta (Table D, Figure IV-1). The urban runoff allocations implicitly include all current and future urban discharges not otherwise addressed by another allocation within the geographic boundaries of urban runoff management agencies, including but not limited to Caltrans roadway and non-roadway facilities and rights-of-way, public facilities, properties proximate to banks of waterways, industrial facilities, and construction sites. Methylmercury allocations are required to be met by 2014 unless MS4 dischargers or discharger groups complete the studies and submit to the Regional Board the management plan discussed below by December 2012.

Phase I MS4s are required to:

1. Complete **Characterization and Control Studies** to characterize methyl and total mercury concentrations and loads in MS4 discharges and receiving waters and to identify variables that control methylmercury production; and

[1] Major reservoirs and lakes in the Sacramento Basin are Shasta, Whiskeytown, Oroville, Englebright, Camp Far West, Folsom/Natoma, and Black Butte, Indian Valley, Clear Lake and Lake Berryessa. Major reservoirs and lakes in the San Joaquin Basin are Camanche, New Hogan, New Melones/Tulloch, Don Pedro, McClure, Burns, Owens, Eastman, Hensley, Millerton and Marsh Creek.

[2] Monthly concentration shall be an average of all effluent concentration data collected that month. Non-detect measurements shall use one-half of the detection level (minimum detection level 0.2 ng/l) for the calculations.

[3] Annual average concentration shall be average of monthly averages. Monthly averages are the mean of all data collected during a given month.

2. Develop best management practices that can be implemented to achieve the methylmercury allocations and maintain the total mercury load limits, a time schedule for implementation and, if applicable, detailed information documenting why full achievement of the methylmercury allocations and total mercury load limits is infeasible.

Phase II MS4s are encouraged to coordinate with Phase I MS4s in completion of the studies described above. MS4s that are designated after the effective date of this amendment may necessitate adjustments to the methylmercury allocations. Urban areas (including industrial and construction discharges) that are not regulated by MS4s shall maintain their existing methylmercury discharges. These discharges will be assigned allocations in 2014.

Total mercury limits apply to MS4 (Table E) discharges within the Delta and in tributaries to the Delta downstream from major dams. The total mercury limit for MS4 discharges shall be the 10-year annual average mercury load calculated for 2002 through 2011. Annual total mercury loads shall be calculated by the average total mercury concentration measured in urban runoff multiplied by annual average runoff volume for 2002 through 2011, or alternate method approved by the Executive Officer.

Dredging

There shall be no net increase in methyl and total mercury loads from dredging activities in Delta waterways. Clean Water Act 401 Water Quality Certifications shall include the following conditions:

1. Characterize methyl and total mercury loads removed from Delta waterways by dredging activities.
2. Conduct before-and-after surface sediment monitoring to ensure that newly-exposed sediment has an average total mercury concentration less than the surface material before dredging.
3. Employ management practices during and after dredging activities to minimize sediment releases into water column.
4. Ensure that disposal of dredged material with average total mercury concentrations greater than 0.2 mg/kg (dry weight, fines < 63 microns), is protected from erosion by 100-year precipitation or flow conditions.
5. Ensure that return flows from the disposal of dredged material do not have methylmercury concentrations greater than the receiving water concentration.

Flood Conveyance Flows and
Water Management and Storage

Methylmercury flux from sediment in open waters of the Delta needs to be maintained at existing levels (Table F).

Flood conveyance inputs from the Yolo Bypass, water management activities (e.g., the South Delta Improvement Project or new or expanded reservoirs), and seasonal wetland flooding may influence ambient methylmercury levels in the Delta. Parties responsible for flood conveyance activities include USACE, State Reclamation Board, DWR, USFWS, CDFG, Sacramento Area Flood Control Agency, local reclamation districts, levee and drainage districts and municipalities. Parties responsible for salinity control and other water management activities in the Delta include SWRCB, DWR and USBR.

The Regional Board requires that the parties responsible for flood conveyance projects coordinate with wetland and agricultural landowners to characterize existing methylmercury discharges to open waters from lands immersed by managed flood flows and to develop control measures.

In addition, the Regional Board requires that the parties responsible for water supply management in the Delta conduct collaborative studies to characterize baseline methylmercury production in open channels during different flow conditions in the Delta, in particular:

1. Evaluate direct and indirect effects of flow management practices on sulfate concentrations and methylmercury production in the Delta; and
2. Conduct sulfate amendment studies to determine whether sulfate concentrations affect methylmercury production rates and resulting ambient water column concentrations in the Delta.

Changes in flood conveyance, water delivery to, diversions from, or storage in the Delta, and salinity standards or flow management practices used to maintain current salinity standards could affect methyl and total mercury loading to the Delta. The SWRCB is requested to evaluate direct and indirect effects of changes in salinity standards on methylmercury production. If changes to the salinity standards (or flow management practices used to maintain current salinity standards) would increase methylmercury levels, then the SWRCB should require responsible agencies to conduct studies and develop management plans to reduce methylmercury concentrations. As necessary, management plans should be developed prior to changes in salinity standards.

Inter-agency agreements and coordination with SWRCB authority over water rights will be needed to ensure that existing and potential impacts are properly characterized and controlled.

The Regional Board requires that responsible parties for existing and proposed flood conveyance and water management projects complete **Characterization and Control Studies** by 2012. By December 2014, the Regional Board will evaluate the studies and management practices and determine whether to implement control actions or modify allocations. Responsible agencies may participate in a mercury offset program.

Cache Creek Settling Basin

The Delta mercury control program requires a total mercury reduction of 53 kg/yr from the Cache Creek Settling Basin in addition to mercury reduction efforts described in the Cache Creek Watershed Program. The tributary total mercury load limits are based on 20-year average loads for water years 1984 through 2003, which includes a mix of wet and dry years that is statistically similar to what has occurred in the Sacramento Basin over the last 100 years. By 31 December 2007, the Regional Board requires that responsible agencies for Cache Creek Settling Basin operations and maintenance propose a plan for removing contaminated sediments and improving the trapping efficiency of the basin to reduce the total mercury discharge. Responsible agencies include DWR and USACE. By 31 December 2010, responsible agencies shall implement control actions to reduce total mercury loads from the Settling Basin. Total mercury load reductions from the Cache Creek Settling Basin may be accomplished, in part, through a mercury offset program.

Table G identifies the methylmercury allocation for the Cache Creek Settling Basin. The Regional Board requires that by 31 December 2012 responsible agencies complete **Characterization and Control Studies** and develop management practices to achieve the methylmercury allocation.

Additional mercury control actions for the settling basin may be required to further reduce mercury in the Yolo Bypass.

Tributary Watersheds

Table G identifies methylmercury allocations for tributary inputs to the Delta.

The sum total of 20-year average mercury loads from the American River, Putah Creek, and Feather River needs to be reduced by 38 kg/yr, from 104 to 66 kg/yr. This reduction will be implemented by future TMDL programs for these watersheds. The tributary total mercury load limits are based on 20-year average loads for water years 1984 through 2003, which includes a mix of wet and dry years that is statistically similar to what has occurred in the Sacramento Basin over the last 100 years. Additional total mercury load reductions may be required to accomplish future water quality objectives to be established for those watersheds.

Public Education

The local county health departments should expand current outreach and education regarding the risks of consuming fish containing mercury, emphasizing portions of the population that are at highest risk, such as pregnant women and children. The Regional Board will work towards developing a strategy for public outreach and education and will support stakeholders implementing the strategy. The Regional Board encourages dischargers of methyl and total mercury to promote public education programs and work with at-risk fish consumers to develop community-based risk reduction and mitigation strategies aimed at lowering their risk to eating locally caught fish.

The Regional Board recommends that the California Department of Health Services provide expanded public outreach and education to reduce methylmercury health risks to people consuming local fish.

Adaptive Implementation

The Regional Board recognizes that meeting the methylmercury allocations, total mercury limits, and other requirements of this control program may be difficult. Therefore, prior to the 2014 deadline for achieving the methylmercury allocations specified in this control program, the Regional Board will evaluate the results of the control studies and implementation plans developed by dischargers to determine whether adjustments in allocations or time schedules need to be made. By 2014, the Regional Board will consider adoption of an offset program that will allow dischargers to offset methylmercury in excess of requirements by implementing more feasible or cost effective projects elsewhere in the watershed. Participation in the offset program will be allowed only after dischargers have completed control studies, as described in this control program, and clearly demonstrated that meeting the methylmercury allocations or total mercury limits is infeasible or impracticable.

Monitoring and Review

The monitoring guidance for the Delta is described in Chapter V, Surveillance and Monitoring.

Recommendations for Other Agencies

Atmospheric deposition of mercury in the Central Valley tributary watersheds needs to be maintained at existing levels. Atmospheric deposition is a statewide issue and some sources originate outside of the state. A memorandum of understanding should be developed between USEPA, the State Water Board, and the Air Resources Board to conduct studies to evaluate local and statewide air emissions and deposition patterns and to develop and implement a load reduction program(s). The study results and implementation options will be reviewed by the Regional Board in 2014.

Revise Chapter IV (Implementation), under "Estimated Costs of Agricultural Water Quality Control Programs and Potential Sources of Financing" to add:

The total estimated costs for management practices to meet the Delta methylmercury objective range from $xxx to $xxx. The estimated costs for discharger compliance monitoring, planning and evaluation range from $xxx to $xxx million. The estimated total annual costs range from $xxx million to $xxx million (2006 dollars).

Potential funding sources include:

1. Those identified in the San Joaquin River Subsurface Agricultural Drainage Control Program and the Pesticide Control Program.

Revise Chapter V, (Surveillance and Monitoring) to add:

Delta

The Central Valley Water Board will use the following criteria to determine compliance with the methylmercury fish tissue objectives in the Sacramento-San Joaquin Delta.

The representative fish species for each trophic level shall be:

- Trophic Level 4: bass (largemouth and striped), white catfish, crappie, and Sacramento pikeminnow.
- Trophic Level 3: American shad, black bullhead, bluegill, carp, Chinook salmon, redear sunfish, Sacramento blackfish, Sacramento sucker, and white sturgeon.
- Trophic Level 2 or 3 fish less than 50 mm: inland silverside, juvenile bluegill, mosquitofish, red shiner, threadfin shad, or other fish of this size commonly consumed by wildlife species in the Delta.

Sample sets for large trophic level 3 and 4 fish shall include three species from each trophic level and shall include anadromous and non-anadromous fish. Sample sets for the large fish shall include a range of sizes of fish between 150-500 mm total length, with average length of 350 mm. Striped bass, largemouth bass, and sturgeon caught for mercury analysis should be within the CDFG legal catch size limits. Sample sets for fish less than 50 mm shall include at least two fish species. To attain compliance, the average concentration of methylmercury in sample sets for each subarea shall equal the objectives for three consecutive years. In any subarea, if multiple species for a particular trophic level are not available, one species in the sample set is acceptable.

The largemouth bass implementation goal may be used as a cost-effective tool to track progress toward meeting the fish tissue objectives. The largemouth bass implementation goal is 0.24 mg methylmercury/ wet weight muscle tissue of largemouth bass at a standard, total length of

350 mm. This implementation goal corresponds to the fish tissue objectives and is expected to protect humans and wildlife species that eat fish from a mixture of trophic levels.

The aqueous methylmercury goal is in the form of the annual average concentration in unfiltered samples of ambient water. Water samples should be collected seasonally throughout the year during typical flow conditions.

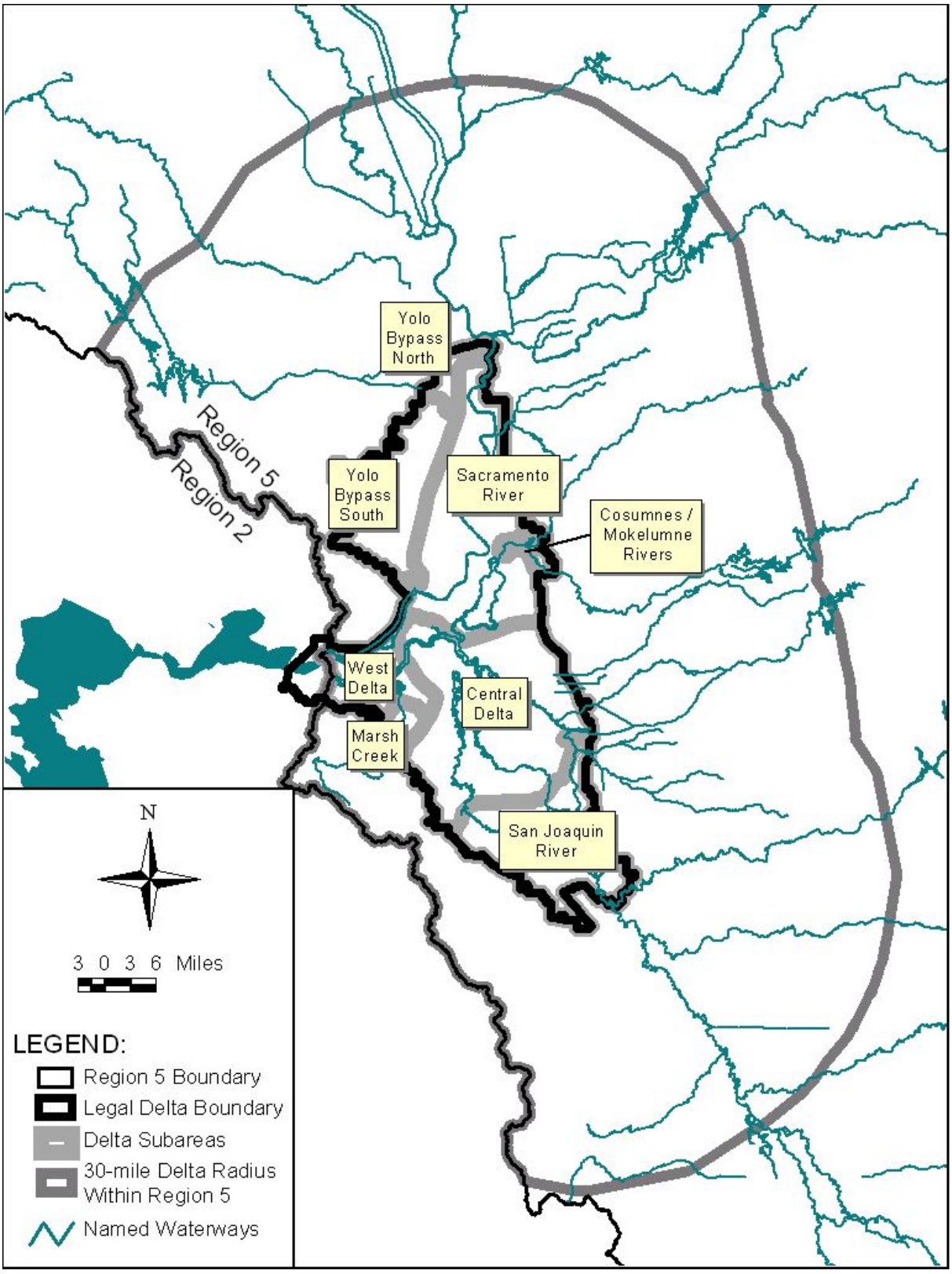

Figure IV-1 Delta Subareas for Delta Methylmercury Program

TABLE A
AGRICULTURE AND WETLAND METHYLMERCURY ALLOCATIONS

DELTA SUBAREA RECEIVING SOURCE INPUT	PROXIMITY TO DELTA	SOURCE	EXISTING LOAD (g/yr)	PERCENT REDUCTION REQUIRED	LOAD ALLOCATION (g/yr)
Central Delta	Within Subarea	Agriculture	37	0%	37
		Wetlands	135	0%	135
	Within 30-Miles Upstream of Subarea	Agriculture	*Upstream values to be included in the next draft of the Proposed BPA staff report.*		
		Wetlands			
Marsh Creek	Within Subarea	Agriculture	2.2	75%	0.58
		Wetlands	0.40	75%	0.10
	Within 30-Miles Upstream of Subarea	Agriculture	*tbd*	75%	*tbd*
		Wetlands	*tbd*	75%	*tbd*
Mokelumne/ Cosumnes Rivers	Within Subarea	Agriculture	1.6	65%	0.56
		Wetlands	12	65%	4.2
	Within 30-Miles Upstream of Subarea	Agriculture	*tbd*	65%	*tbd*
		Wetlands	*tbd*	65%	*tbd*
Sacramento River	Within Subarea	Agriculture	36	54%	19
		Wetlands	66	54%	35
	Within 30-Miles Upstream of Subarea	Agriculture	*tbd*	54%	*tbd*
		Wetlands	*tbd*	54%	*tbd*
San Joaquin River	Within Subarea	Agriculture	23	82%	4.1
		Wetlands	18	82%	3.2
	Within 30-Miles Upstream of Subarea	Agriculture	*tbd*	82%	*tbd*
		Wetlands	*tbd*	82%	*tbd*
West Delta	Within Subarea	Agriculture	4.1	0%	4.1
		Wetlands	121	0%	121
	Within 30-Miles Upstream of Subarea	Agriculture	*tbd*	0%	*tbd*
		Wetlands	*tbd*	0%	*tbd*
Yolo Bypass	Within Subarea	Agriculture	19	83%	3.2
		Wetlands	415	85%	62
	Within 30-Miles Upstream of Subarea	Agriculture	*tbd*	83%	*tbd*
		Wetlands	*tbd*	85%	*tbd*

TABLE B
MUNICIPAL AND INDUSTRIAL WASTEWATER
METHYLMERCURY WASTE LOAD ALLOCATIONS BY DELTA SUBAREA

PERMITTEE	PERMIT #	EXISTING MeHg CONCEN-TRATION (ng/l)	PERCENT REDUCTION REQUIRED	ALLOCATED MeHg CONCEN-TRATION (ng/l) (a)	ALLOCATED MeHg LOAD (g/yr)	2005 EFFLUENT VOLUME (mgd) (b)
Central Delta Subarea – Within Delta Facilities (c)						
Discovery Bay WWTP	CA0078590	0.20	0%	0.20	0.42	1.5
Lodi (City of) White Slough WWTP	CA0079243	0.13	0%	0.13	0.72	4.0
San Joaquin Co DPW CSA 31-Flag City WWTP	CA0082848	0.09	0%	0.09	0.007	0.06
Marsh Creek Subarea – Within Delta Facilities (c)						
Brentwood (City of) WWTP	CA0082660	0.02	0%	0.02	(a)	3.1
Mokelumne River Subarea –Facilities that Discharge to Tributaries within 30 Miles of the Subarea (c)						
CDFG Mokelumne River Fish Hatchery	CA0004791		64%			
El Dorado ID Deer Creek WWTP	CA0078662		64%			
El Dorado ID El Dorado Hills WWTP	CA0078671		64%			
Galt WWTP	CA0081434		64%			
Sacramento River Subarea – Within-Subarea Facilities						
Rio Vista (City of) WWTP	CA0079588	0.16	46%	0.09	0.06	0.47
Rio Vista (City of) Trilogy WWTP	CA0083771	(d)				0.2
SRCSD-Elk Grove Walnut Grove WWTP	CA0078794	1.7	46%	0.91	0.10	0.08
Sacramento (City of) Combined WWTP	CA0079111	(e)				1.3
SRCSD Sacramento River WWTP	CA0077682	0.73	46%	0.39	84	156
West Sacramento (City of) WWTP	CA0079171	0.05	100%	0.05	(a)	5.6
Sacramento River Subarea – Facilities that Discharge to Tributaries within 30 Miles Upstream of the Subarea						
Auburn WWTP	CA0077712		46%			
CDFG Nimbus Fish Hatchery	CA0004774		46%			
DGS Office of State Publishing	CA0078875		46%			
Formica Corporation Sierra Plant	CA0004057		46%			
Lincoln WWTP	CA0084476		46%			
Pacific Coast Sprout Farms, Inc. (Sacramento)	CA0082961		46%			
Placer Co. SA #28 Zone #6	CA0079341		46%			
Placer Co. SMD #3 WWTP	CA0079367		46%			
Proctor & Gamble Co. WWTP	CA0004316		46%			
Roseville Dry Creek WTP	CA0079502		46%			
Roseville Pleasant Grove WTP	CA0084573		46%			
United Auburn Indian Community Casino WWTP	CA0084697		46%			
San Joaquin River Subarea – Within-Subarea Facilities						
Deuel Vocational Inst. WWTP	CA0078093	0.02	0%	0.02	(a)	0.47
Manteca Aggregate Sand Plant	CA0082783	0.032	0%	0.03	(a)	9.2
Manteca (City of) WWTP	CA0081558	0.216	72%	0.06	(a)	4.6
Mountain House CSD WWTP	CA0084271	(f)				5.4 (e)

Upstream values to be included in the next draft of the Proposed BPA staff report.

Upstream values to be included in the next draft of the Proposed BPA staff report.

PERMITTEE	PERMIT #	EXISTING MeHg CONCEN-TRATION (ng/l)	PERCENT REDUCTION REQUIRED	ALLOCATED MeHg CONCEN-TRATION (ng/l) (a)	ALLOCATED MeHg LOAD (g/yr)	2005 EFFLUENT VOLUME (mgd) (b)
Stockton (City of) WWTP	CA0079138	0.936	82%	0.17	6.4	28
Tracy (City of) WWTP	CA0079154	0.146	59%	0.06	(a)	9.5
San Joaquin River Subarea – Facilities that Discharge to Tributaries within 30 Miles Upstream of the Subarea						
Altamont Landfill and Resource	CA0083763		63%			
Canada Cove LP French Camp Golf & RV Park	CA0083682		63%			
Hershey Chocolate USA, Oakdale	CA0004146		63%			
J.F. Enterprises Worm Farm	CA0081949		63%			
Modesto ID Regional WTP	CA0083801		63%			
Modesto WQCF	CA0079103		63%			
Turlock WWTP	CA0078948		63%			
Yolo Bypass Subarea – Facilities that Discharge to Tributaries within 30 Miles Upstream of the Subarea						
Davis WWTP	CA0079049		78%			
University of California, Davis (UC Davis) WWTP	CA0077895		78%			
UC Davis Center for Aquatic Biology & Aquaculture	CA0083348		78%			
USDI UC Davis Aquatic Weed Laboratory	CA0083364		78%			
UC Davis Hydraulics Laboratory	CA0084182		78%			
Vacaville Easterly WWTP Plant	CA0077691		78%			
Woodland WWTP	CA0077950		78%			

Upstream values to be included in the next draft of the Proposed BPA staff report.

Upstream values to be included in the next draft of the Proposed BPA staff report.

(a) This table lists facilities within the Delta and within 30 miles of the Delta by the Delta subarea that receives the discharge. Facilities with existing average effluent methylmercury concentrations less than 0.06 ng/l, or allocated effluent methylmercury concentrations of 0.06 ng/l, do not have load limits; however, they do have concentration limits and must therefore maintain the concentrations listed in this table.

(b) Facilities that discharged greater than 1 mgd in 2005 shall participate in the **Characterization and Control Studies**.

(c) As of 20 March 2006, there are no permitted facilities that discharge to surface water within the Mokelumne River, Yolo Bypass and West Delta subareas or within 30 miles upstream of the Central Delta, West Delta and Marsh Creek subareas, other than heating/cooling, power, or groundwater treatment facilities. Available information indicates that such facilities do not contribute measurable amounts of methylmercury loading to the Delta. If future studies indicate otherwise, allocations will be developed for these facilities.

(d) During the period of TMDL development, several facilities in the Delta or within 30 miles of the Delta were undergoing substantial changes in treatment processes or other plant upgrades that could affect their methylmercury discharges. The Regional Board Executive Officer issued a California Water Code Section 13267 order to these facilities requiring the characterization of their effluent once plant upgrades are completed. Allocations for these facilities will be developed upon availability of methylmercury data representative of plant upgrades. Facilities that discharged greater than 1 mgd in 2005 shall participate in the **Characterization and Control Studies**.

(e) The Sacramento Combined WWTP (CA0079111) operates only when combined wastewater/storm flows that are normally conveyed to the SRCSD's Sacramento River WWTP (CA0077682) exceed 60 MGD. A California Water Code Section 13267 order was issued but effluent methylmercury data are not yet available.

(f) The Mountain House CSD WWTP (CA0084271) is included on this table because it has expected to begin discharge to surface water within the next two years. It is permitted to discharge 5.4 mgd, and therefore shall participate in the **Characterization and Control Studies**. A methylmercury allocation will be developed based on characterization of the effluent once plant upgrades are completed and discharge to surface water begins.

TABLE C
NPDES PERMITTED FACILITIES IN THE DELTA AND ITS TRIBUTARY WATERSHEDS DOWNSTREAM OF MAJOR DAMS WITH 2008 TOTAL MERCURY LOAD LIMITS

FACILITY (NPDES NO.)	FACILITY (NPDES NO.)
FACILITIES WITHIN THE DELTA	
Brentwood WWTP (CA0082660) Discovery Bay WWTP (CA0078590) Lodi White Slough WWTP (CA0079243) Manteca Aggregate Sand Plant (CA0082783) Manteca WWTP (CA0081558) Mountain House CSD WWTP (CA0084271)	Sacramento Combined WWTP (CA0079111) SRCSD Sacramento River WWTP (CA0077682) Stockton WWTP (CA0079138) Tracy WWTP (CA0079154) West Sacramento WWTP (CA0079171)
FACILITIES IN THE TRIBUTARY WATERSHEDS DOWNSTREAM OF MAJOR DAMS	
Aerojet Interim Groundwater Treatment Plant (CA0083861) Anderson WPCP (CA0077704) Atwater WWTF (CA0079197) Auburn WWTP (CA0077712) Boeing Company Interim Treatment System (CA0084891) Chico Regional WWTF (CA0079081) Corning Industries/ Domestic WWTF (CA0004995) Davis WTP (CA0079049) Defense Logistics Agency Sharpe Groundwater Cleanup (CA0081931) El Dorado Irrigation District Deer Creek WWTP (CA0078662) El Dorado Irrigation District El Dorado Hills WWTP (CA0078671) Galt WWTP (CA0081434) General Electric Co. GWCS (CA0081833) Hershey Chocolate USA, Oakdale (CA0004146) J.F. Shea Co Fawndale Rock and Asphalt (CA0083097) Lincoln WWTP (CA0084476) Linda Co Water Dist WPCP (CA0079651) Live Oak (CA0079022)	Merced WWTF (CA0079219) Modesto WQCF (CA0079103) Olivehurst PUD WWTP (CA0077836) Oroville WWTP (CA0079235) Pactiv Molded Pulp Mill (CA0004821) Placer Co. SMD #1 WWTP (CA0079316) Proctor & Gamble Co. WWTP (CA0004316) Red Bluff WWRP (CA0078891) Redding Clear Creek WWTP (CA0079731) Redding Stillwater WWTP (CA0082589) Roseville Dry Creek WTP (CA0079502) Roseville Pleasant Grove WTP (CA0084573) Turlock WWTP (CA0078948) University of California, Davis WTP (CA0077895) U.S. Air Force McClellan Air Force Base Groundwater Extraction & Treatment System (CA0081850) Vacaville Easterly Sewage Plant (CA0077691) Woodland WWTP (CA0077950) Yuba City WW Reclamation Plant (CA0079260)

MeHg load allocations will be updated to include upstream component in the next draft of the Proposed BPA staff report.

TABLE D
MS4 METHYLMERCURY WASTE LOAD ALLOCATIONS

PERMITTEE	PERMIT #	PROXIMITY TO DELTA (a)	EXISTING LOAD (g/yr)	PERCENT REDUCTION REQUIRED	LOAD ALLOCATION (g/yr) (a, b)	PHASE (c)
Central Delta Subarea Waste Load Allocations						
Contra Costa (County of)	CAS083313	Within-Delta & Upstream	0.75	0%	0.75	I
Lodi (City of)	CAS000004	Within-Delta & Upstream	0.053	0%	0.053	II
Port of Stockton MS4	CAS084077	Within-Delta & Upstream	0.39	0%	0.39	I
San Joaquin (County of)	CAS000004	Within-Delta & Upstream	0.57	0%	0.57	I
Stockton Area MS4	CAS083470	Within-Delta & Upstream	3.6	0%	3.6	I
Marsh Creek Subarea Waste Load Allocations						
Contra Costa (County of)	CAS083313	Within-Delta & Upstream	1.2	74%	0.31	I
Mokelumne River Subarea Waste Load Allocations						
Lodi (City of)	CAS000004	Upstream				II
Sacramento Area MS4	CAS082597	Upstream				I
San Joaquin (County of)	CAS000004	Within-Delta	0.51	65%	0.018	II
Sacramento River Subarea Waste Load Allocations						
Butte (County of)	CAS000004	Upstream				II
Chico (City of)	CAS000004	Upstream				II
Lincoln (City of)	CAS000004	Upstream				II
Loomis (City of)	CAS000004	Upstream				II
Marysville (City of)	CAS000004	Upstream				II
Rio Vista (City of)	CAS000004	Within-Delta & Upstream	0.014	46%	0.01	II
Rocklin (City of)	CAS000004	Upstream				II
Roseville (City of)	CAS000004	Upstream				II
Sacramento Area MS4	CAS082597	Within-Delta & Upstream	3.0	46%	1.6	I
San Joaquin (County of)	CAS000004	Within-Delta	0.19	46%	0.10	II
Solano (County of)	CAS000004	Within-Delta & Upstream	0.074	46%	0.040	II
Sutter (County of)	CAS000004	Upstream				II
West Sacramento (City of)	CAS000004	Within-Delta & Upstream	0.62	46%	0.33	II
Yolo (County of)	CAS000004	Within-Delta	0.073	46%	0.039	II
Yuba (County of)	CAS000004	Upstream				II
Yuba City (City of)	CAS000004	Upstream				II
San Joaquin River Subarea Waste Load Allocations						
Ceres (City of)	CAS000004	Upstream				II
Hughson (City of)	CAS000004	Upstream				II
Lathrop (City of)	CAS000004	Within-Delta & Upstream	0.27	75%	0.07	II
Manteca (City of)	CAS000004	Upstream				II
Modesto (City of)	CAS083526	Upstream				I
Oakdale (City of)	CAS000004	Upstream				II
Patterson (City of)	CAS000004	Upstream				II
Port of Stockton MS4	CAS084077	Within-Delta & Upstream	0.0096	75%	0.0024	I
Ripon (City of)	CAS000004	Upstream				II
Riverbank (City of)	CAS000004	Upstream				II

MeHg load allocations will be updated to include upstream component in the next draft of the Proposed BPA staff report.

TABLE D
MS4 METHYLMERCURY WASTE LOAD ALLOCATIONS

PERMITTEE	PERMIT #	PROXIMITY TO DELTA (a)	EXISTING LOAD (g/yr)	PERCENT REDUCTION REQUIRED	LOAD ALLOCATION (g/yr) (a, b)	PHASE (c)
San Joaquin (County of)	CAS000004	Within-Delta & Upstream	2.6	75%	0.65	II
Stanislaus (County of)	CAS000004	Upstream				II
Stockton Area MS4	CAS083470	Within-Delta & Upstream	0.50	75%	0.12	I
Tracy (City of)	CAS000004	Within-Delta & Upstream	1.8	75%	0.45	II
Turlock (City of)	CAS000004	Upstream				II
West Delta Subarea Waste Load Allocations						
Contra Costa (County of)	CAS083313	Within-Delta & Upstream	3.3	0%	3.3	I
Solano (County of)	CAS000004	Upstream				II
Yolo Bypass Subarea Waste Load Allocations						
Dixon (City of)	CAS000004	Upstream				II
Solano (County of)	CAS000004	Within-Delta & Upstream	0.085	75%	0.021	II
Vacaville (City of)	CAS000004	Upstream				II
West Sacramento (City of)	CAS000004	Within-Delta & Upstream	1.1	75%	0.27	II
Yolo (County of)	CAS000004	Within-Delta & Upstream	0.12	75%	0.030	II

(a) Some MS4s service areas span multiple Delta subareas and tributary watersheds, and are therefore listed more than once. Separate allocations are needed for each Delta subarea because different levels of reduction are required to achieve the water quality objective in each subarea. If an MS4 service area discharges within a given Delta subarea and within 30 miles upstream of that subarea, its within-Delta and upstream allocations are summed. The allocated methylmercury loads for all MS4s are based on the average methylmercury loads estimated in runoff from urban areas in or near the Delta for water years 2000 through 2003, a relatively dry period. Actual loads are expected to fluctuate with water volume and other factors. The above allocations may be adjusted based on new information for wet years as needed during future Basin Plan reviews.

(b) The methylmercury load allocations include all current and future permitted urban discharges not otherwise addressed by another allocation within the geographic boundaries of urban runoff management agencies, including but not limited to Caltrans facilities and rights-of-way (CAS000003), public facilities, properties proximate to banks of waterways, industrial facilities, and construction sites.

(c) Phase 1 MS4s shall participate in the **Characterization and Control Studies**.

TABLE E
MS4S IN THE DELTA AND ITS TRIBUTARY WATERSHEDS DOWNSTREAM OF MAJOR DAMS WITH 2014 TOTAL MERCURY LOAD LIMITS (a)

MS4 (NPDES NO.)	PHASE	MS4 (NPDES NO.)	PHASE
MS4s WITHIN THE DELTA			
Contra Costa (County of) (CAS083313)	I	San Joaquin (County of) (CAS000004)	II
Lathrop (City of) (CAS000004)	I	Solano (County of) (CAS000004)	II
Lodi (City of) (CAS000004)	II	Stockton Area MS4 (CAS083470)	I
Port of Stockton MS4 (CAS084077)	I	Tracy (City of) (CAS000004)	II
Rio Vista (City of) (CAS000004)	II	West Sacramento (City of) (CAS000004)	II
Sacramento Area MS4 (CAS082597)	I	Yolo (County of) (CAS000004)	II
MS4S IN THE TRIBUTARY WATERSHEDS DOWNSTREAM OF MAJOR DAMS			
Butte (County of) (CAS000004)	II	Ripon (City of) (CAS000004)	II
Ceres (City of) (CAS000004)	II	Riverbank (City of) (CAS000004)	II
Chico (City of) (CAS000004)	II	Rocklin (City of) (CAS000004)	II
Contra Costa (County of) (CAS083313)	I	Roseville (City of) (CAS000004)	II
Dixon (City of) (CAS000004)	II	Sacramento Area MS4 (CAS082597)	I
Hughson (City of) (CAS000004)	II	San Joaquin (County of) (CAS000004)	II
Lathrop (City of) (CAS000004)	II	Solano (County of) (CAS000004)	II
Lincoln (City of) (CAS000004)	II	Stanislaus (County of) (CAS000004)	II
Lodi (City of) (CAS000004)	II	Stockton Area MS4 (CAS083470)	I
Loomis (City of) (CAS000004)	II	Sutter (County of) (CAS000004)	II
Manteca (City of) (CAS000004)	II	Tracy (City of) (CAS000004)	II
Marysville (City of) (CAS000004)	II	Turlock (City of) (CAS000004)	II
Modesto (City of) (CAS083526)	I	Vacaville (City of) (CAS000004)	II
Oakdale (City of) (CAS000004)	II	West Sacramento (City of) (CAS000004)	II
Patterson (City of) (CAS000004)	II	Yolo (County of) (CAS000004)	II
Port of Stockton MS4 (CAS084077)	I	Yuba City (City of) (CAS000004)	II

(a) Including CalTrans Statewide permit #CAS000003

MeHg load allocations will be updated to include upstream component in the next draft of the Proposed BPA staff report.

TABLE F
OPEN WATER METHYLMERCURY LOAD ALLOCATIONS

DELTA SUBAREA	PROXIMITY TO DELTA	EXISTING LOAD (g/yr)	PERCENT REDUCTION REQUIRED	LOAD ALLOCATION (g/yr) (a)
Central Delta	Within Subarea	301	0%	301
	Within 30 Miles			
Marsh Creek	Within Subarea	0.03	0%	0.03
	Within 30 Miles			
Mokelumne River	Within Subarea	1.1	0%	1.1
	Within 30 Miles			
Sacramento River	Within Subarea	118	0%	118
	Within 30 Miles			
San Joaquin River	Within Subarea	20	0%	20
	Within 30 Miles			
West Delta	Within Subarea	190	0%	190
	Within 30 Miles			
Yolo Bypass	Within Subarea	86	0%	86
	Within 30 Miles			

(a) Open water methylmercury load allocations are based on methylmercury flux from sediment in open water habitat (data collected in May 2000 and October 2001).

TABLE G
TRIBUTARY WATERSHED METHYLMERCURY ALLOCATIONS

DELTA SUBAREA	TRIBUTARY (a)		MeHg LOAD (g/yr) (b,c)	MeHg CONCENTRATION (ng/l)
Central Delta	Calaveras River		25	0.14
	Bear/Mosher Creeks		11	0.31
	Bethany Reservoir Area		(d)	(d)
Marsh Creek	Marsh Creek		0.50	0.07
Mokelumne River	Mokelumne River		38	0.06
San Joaquin River	San Joaquin River		123	0.06
	French Camp Slough		4.5	0.06
	Manteca-Escalon, Mountain House & Corral Hollow Creeks Areas		(d)	(d)
West Delta	Antioch & Montezuma Hills Areas		(d)	(d)
Sacramento Basin (b,d)	Delta Inputs	Sacramento River	1,078	0.06
		Prospect Slough	81	0.06
		Morrison Creek	4.4	0.06
		Ulatis Creek	2.0	0.06
	Upstream Tributaries	Cache Creek Settling Basin	28	0.06
		American River	139	0.05 (e)
		Feather River	407	0.06
		Putah Creek	24	0.06

(a) The methylmercury load allocations include point and nonpoint sources identified within 30 miles of the Delta, which are addressed by the allocations and characterization and control studies described in previous sections and tables.

(b) Methylmercury allocations are assigned to tributary inputs to the Delta as well as to upstream tributaries in the Sacramento Basin that are required to substantially reduce total mercury loading. The methylmercury allocations for the Sacramento Basin tributaries are based on reductions needed to achieve the implementation goal for ambient methylmercury in the Delta. Methylmercury reduction strategies shall be developed for other upstream tributaries during implementation of the Delta mercury control program and development of TMDLs for upstream water bodies identified as impaired on the Clean Water Act Section 303(d) List.

(c) Methylmercury load allocations are based on water years 2000 through 2003, a relative dry period. Annual loads are expected to fluctuate with water volume and other factors.

(d) Ambient mercury data are not available for smaller tributaries to the Delta and Sacramento Basin. As a result, methylmercury loads are limited to existing conditions.

(e) Methylmercury concentrations in American River exports average 0.05 ng/l. As a result, its methylmercury allocation is set to 0.05 ng/l.